C. C. BISBEE.

Improvement in Endless-Chain Propellers.

No. 131,494. Patented Sep. 24, 1872.

Fig 1.

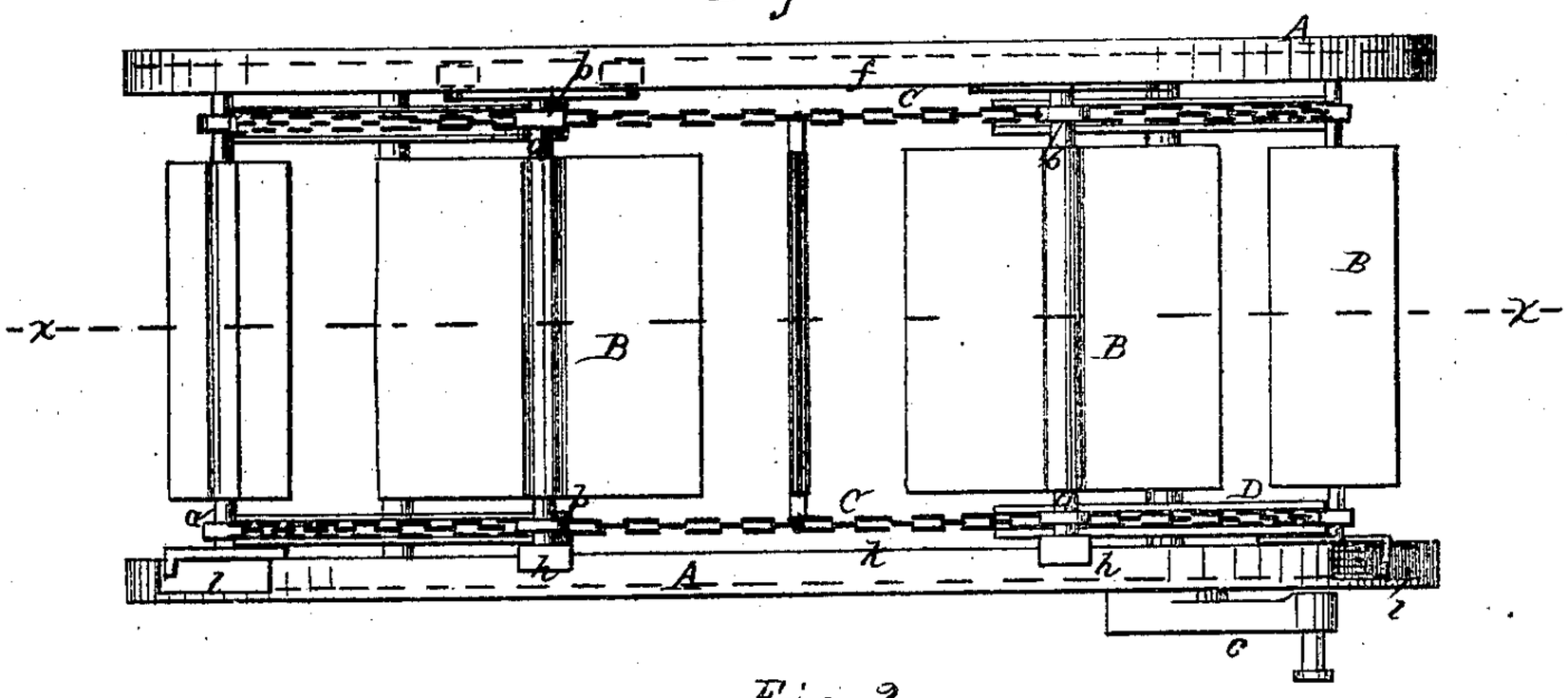


Fig 2.

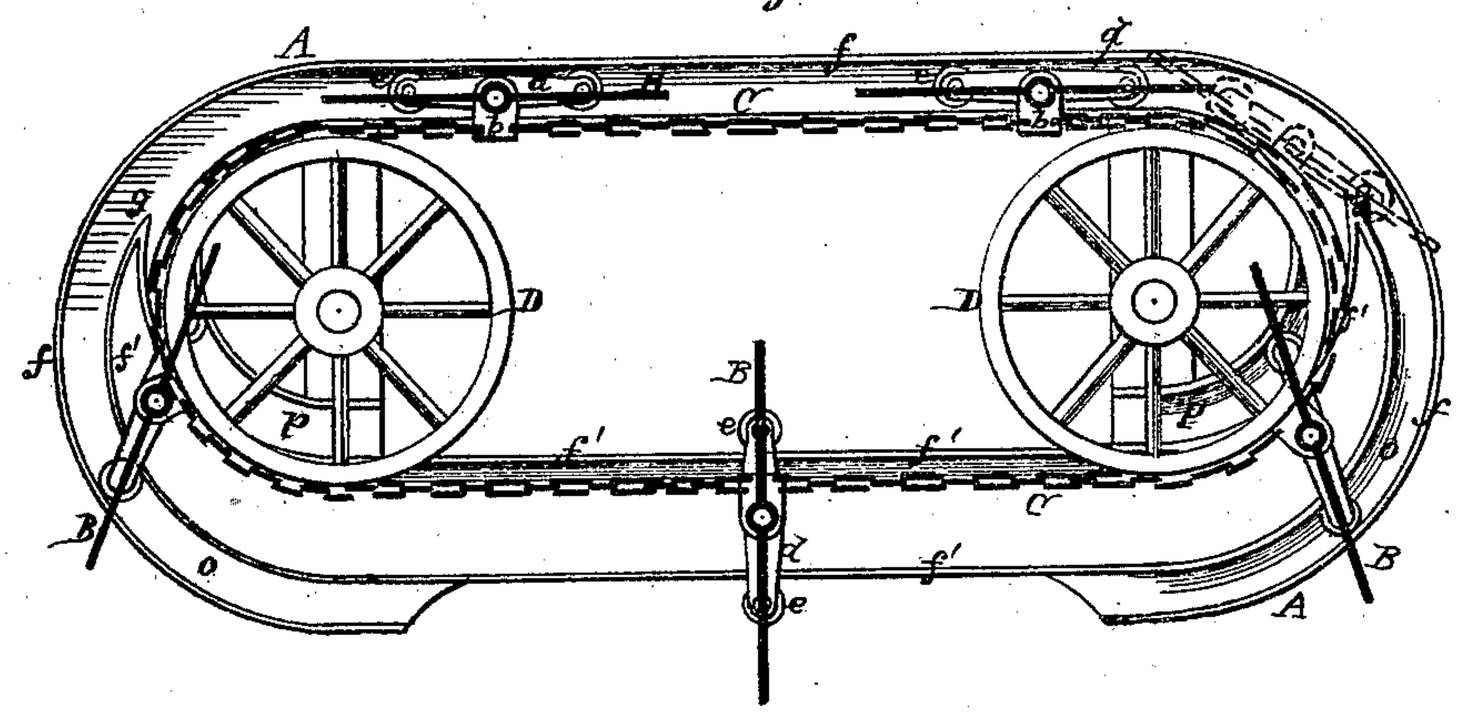
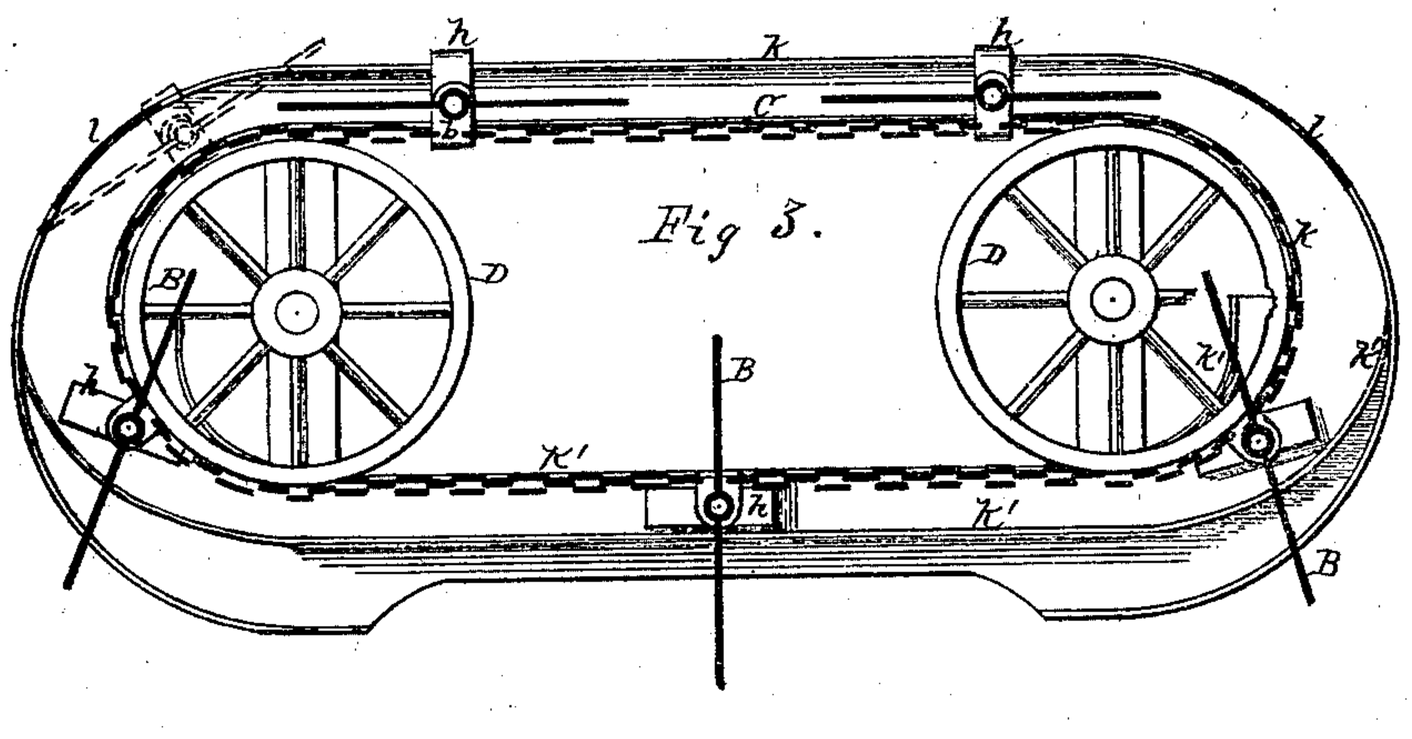


Fig 3.



Witnesses:
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UNITED STATES PATENT OFFICE.

CYRUS C. BISBEE, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN ENDLESS-CHAIN PROPELLERS.

Specification forming part of Letters Patent No. **131,494**, dated September 24, 1872.

To all whom it may concern:

Be it known that I, CYRUS C. BISBEE, of Rochester, in the county of Monroe and State of New York, have invented certain Improvements in Feathering-Paddles for Propellers, of which the following is a specification:

My invention relates to that class of propellers known as "endless-chain paddles;" and it consists more especially in a peculiar arrangement of parts by which the paddles are made feathering, their efficiency increased, and their construction simplified.

Figure 1 is a plan view of my invention. Fig. 2 is a sectional side elevation of those parts above the dotted line *x*, in Fig. 1. Fig. 3 is a similar view of those portions below said dotted line.

A is a framework which supports the working parts of my improved propeller, and which is, preferably, placed in a well-hole at any convenient or suitable point in the vessel, or there may be one placed on each side. B represents paddles, which are supported at or near their center upon trunnions or spindles *a*, which have bearings in blocks *b*. These blocks are mounted at equal distances apart on endless chains C, which run over sets of sprocket-wheels D, and the shafts of these wheels are provided with bearings upon the frame A. One set of wheels may be arranged to be driven directly by the engine by the crank *c*, Fig. 1, or power may be conveyed to them in any other suitable manner. One set of wheels may be made plain, to act only as spreaders for the chains. Each of the paddle-spindles *a* is provided at one extremity with an arm, *d*, rigidly attached thereto, as seen in Fig. 2, and at the ends of these arms I secure the friction-rollers *e*, which move on tracks upon the frame A. These tracks consist of flanges *f f'* formed upon the inner face of said frame A, and they are so arranged at the upper portion of the travel of the paddles as to guide the arms *d* and consequently the paddles when moving in a horizontal position, and upon the lower portion of the travel when said arms and paddles move in a vertical position, as indicated in Fig. 2. The lower tracks *f'* are curved at the extremity so as to meet at the points *g*, and the upper tracks *f* are also curved at the ends of the frame A, but not in concentric circles. By this means the curved passages *o* and *p* are formed between the curved partitions of the two sets of flanges into the outer one of which the advance roller of the arm *d* enters as the chains pass around the wheels D, the rear roller entering the inner passage *p* as the paddle advances. The result of this action is, the paddles enter the water nearly upon their edge, as indicated in Figs. 2 and 3, and retain a vertical position through the lower portion of their travel by means of the rollers *e* running upon the flanges *f'*. Since both ends of the frame A are provided with passages *o p* and the curved flanges for guiding the arms, it follows that the paddles may run in either direction and operate in the same manner, and it will be observed that whichever direction they run, they rise from the water at such an inclination that no back pressure is possible. In order to assist the arms *d* and insure their shifting in the manner described I provide another set of arms, *h*, Figs. 1 and 3, upon the opposite end of the spindles *a*. These are secured at right angles, or nearly so, to the former, and are forked at the outer extremity to embrace the flanges *k*, Fig. 3, upon which they run when the paddles are on the upper portion of their travel, and are fitted to move between the flanges *k'* upon the lower portion of such travel. It will be seen that the arms *h* and ways *k* and *k'* are arranged to act contrary to, but conjointly with, the arms *a* and flanges *f f'*, the latter being horizontal when the others are vertical upon the same paddles, and vice versa. Openings *l*, Figs. 1 and 3, are provided in the outer flange *k*, through which the outer fork of the arm *h* passes, as indicated, and it will be seen by reference to the dotted lines in Figs. 2 and 3 that they do not reach said openings *l* until the advance roller of the arm *d* has passed the point *g* of the cams, thereby preventing premature or wrong shifting of the paddles. The curved passages between the flanges *k'* and *k'* are made wide enough to admit the arms *h* lengthwise and gradually decrease till they just receive them widthwise.

The forks upon the arms *h* may be replaced by friction-rollers, if desirable. It is immaterial to what depth the propeller is immersed, since the paddles are always "feathered" and present only their edges to the water upon the

return portion of their travel, and for these reasons my invention is extremely well adapted to all classes of vessels where loads are constantly varying.

What I claim as my invention is—

In combination with the paddles B and arms *d*, the auxiliary arms *h* and guiding ways *k* and *k'* upon the frame A, substantially as set forth.

C. C. BISBEE.

Witnesses:
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